

CLAIMS

[1] An electronic device comprising:

a wiring substrate including an insulating resin layer having a first major surface and a second major surface and a first wiring layer disposed on said insulating resin layer on the second major surface side;

5 a chip part including a projection electrode on a bottom surface and mounted on said wiring substrate; and

wherein said insulating resin layer holds said chip part such that a bottom and at least a part of side surfaces of said chip part are in contact with said insulating resin layer, and a top surface of said chip part is exposed
10 on said insulating resin layer on the first major surface side, and wherein the projection electrode of the chip part is connected with said first wiring layer.

[2] The electronic device according to Claim 1, wherein a second wiring layer is formed on the first main major surface of said insulating resin layer.

[3] The electronic device according to Claim 2, wherein a ground pattern is formed in said second wiring layer.

[4] The electronic device according to Claim 1, further comprising a plurality of insulating resin layers for holding the chip part.

[5] The electronic device according to Claim 4, wherein the insulating resin layers for holding the chip part are laminated such that the first major surfaces are faced in the same direction.

[6] The electronic device according to Claim 1, wherein said insulating resin layers for holding said chip part are arranged on both surfaces of said wiring substrate.

[7] An electronic device comprising:

a wiring substrate including a plurality of insulating resin layers that are laminated and have first major surfaces and second major surfaces and a first wiring layer disposed on said insulating resin layer on the second major surface side from a lowermost layer to an innermost layer in said resin insulating layers;

a chip part including a projection electrode on a bottom surface and mounted on said wiring substrate; and

wherein said insulating resin layer holds said chip part such that a bottom and side surfaces of said chip part are in contact with said insulating resin layer in a outmost layer, and a top surface of said chip part is exposed on said insulating resin layer on the second major surface side, and wherein the projection electrode of the chip part is connected with said first wiring layer.

[8] The electronic device according to Claim 1 or 7, wherein said wiring substrate further comprises an insulating layer except for said insulating resin layer and further comprises a wiring layer except for said first wiring layer or first and second wiring layers.

[9] The electronic device according to Claim 1 or 7, wherein a portion

exposed from the insulating resin layer of the chip part that enters the insulating resin layer of the outmost layer in the wiring substrate, is covered by a coating resin.

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[10] The electronic device according to Claim 1 or 7, wherein the projection electrode of said chip part is provided with a portion having a sharp tip.

[11] The electronic device according to Claim 1 or 7, wherein the projection electrode of said chip part is a gold electrode formed by a wire bonding technique.

[12] The electronic device according to Claim 1 or 7, wherein said insulating resin layer is made of thermoplastic resin or materials in which thermosetting resin is added to thermoplastic resin.

[13] A method of manufacturing an electronic device, comprising the steps of:

preparing a wiring substrate having an insulating resin layer having a first major surface and a second major surface and a first wiring layer
5 disposed on said insulating resin layer on the second major surface side, and a chip part including a projection electrode;

pushing the chip part into the insulating resin layer from the first major surface; and

passing the projection electrode of the chip part through the insulating
10 resin layer to be connected with the first wiring layer and sealing at least a

surface on which the projection electrode of the chip part is formed with resin of the insulating resin layer.

[14] The method according to Claim 13, wherein the step of pushing said chip part comprises pushing said chip part while heat is applied.

[15] The method according to Claim 13, wherein the step of pushing said chip part comprises pushing said chip part while ultrasonic vibration is applied to said chip part or to said wiring substrate.

[16] The method according to Claim 13, further comprising a step of applying a plasma process or ultraviolet ray irradiation to at least a portion that is to be pushed by said chip part on to the first major surface of said insulating resin layer before the step of pushing said chip part.